Chapter 1

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Introduction

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BACKGROUND

This document is the result of a collaborative effort by several government departments under the auspices of the Department of Housing. Mutual concern for the quality of the built environment and the country's natural resources, as well as a common recognition of the role that human settlement planning and the provision of engineering services plays in its protection or destruction, was the catalyst for this multi-departmental cooperation. The process was overseen by a coordinating committee consisting of representatives of the various departments, whose main role was overall guidance, policy direction and financial control. Detailed guidance and control of the written content was provided by various steering committees, each consisting of a number of practitioners acknowledged for their expertise in the particular fields. The work was contracted to the CSIR in accordance with a detailed proposal submitted to the then National Housing Board in August 1995. Overall project management was undertaken by the CSIR's Division of Building and Construction Technology, while other divisions, as well as various external organisations, also provided technical and related expertise.

NEED FOR A REVISED DOCUMENT

This aspect is best explained by a brief summary of, first, the developments leading to the publication of the first edition of the *Red Book* and, second, the workshops that followed this event. These ultimately led to the formulation of a detailed proposal for a complete revision of the document and the multi-departmental initiatives for funding and guiding the process.

Historical perspective

For many years it has been widely recognised that the cost of providing engineering services forms a significant component of the overall cost of housing. Where capital subsidies for housing schemes are involved, the cost of engineering services could consume anything between 50 and 100% of the subsidy, depending on, among other things, site conditions and levels of service provided (Schlotfeldt 1995b). In any development scheme, therefore, layout planning and the concomitant design of engineering services should receive particular care and attention in order to optimise the levels of service within the given financial parameters. Until comparatively recently engineers were seldom presented with the complex task of choosing between a great variety of service options, particularly in the fields of water supply and sanitation. The policies of the various authorities largely dictated the levels of service to be provided in each case, and engineers merely confined themselves to the technical and contractual aspects of design and construction (Austin 1996).

The last two decades, however, have seen the recognition of, first, the effect of layout planning on the cost of providing engineering services and, second, the impact of services on the continually rising cost of housing. They have also seen the appearance of various guideline documents aimed at optimising the provision of services which are not only of sound engineering quality but acceptable (both financially and technologically) to the recipient communities as well. *The Blue Book*, *Green Book* and *Red Book* guidelines prepared by the CSIR take their titles from the colour of their respective ring binders, and represent some of the efforts made over this period to address the issue. This revised document has evolved partly as a natural progression from the previous guidelines, but has also been substantially revised and expanded to present a holistic, integrated approach to settlement planning.

The previous edition of the Red Book, entitled *Guidelines for the provision of engineering services and amenities in residential township development*, was completed in 1992. Due to the political changes taking place in the country at the time, however, the document was not published until 1994. It was furthermore realised that the guidelines were no longer capable of meeting the challenges facing developers in the times of societal change which the country was experiencing. The book was considered to have a number of shortcomings which restricted its usefulness in the drive to produce sustainable and vibrant human settlements, as opposed to mere serviced townships (Austin and Biermann 1998). Some of the perceived shortcomings were: outdated and unwieldy urban-planning principles, insufficient information on various appropriate engineering technologies, and a general lack of an integrated approach to settlement planning. It was therefore decided to gather feedback from users of the book by means of a series of countrywide workshops, where these and other problems could be debated by experienced professionals.

The purpose of this document is not merely to assist professionals in producing efficiently serviced "townships", but rather to create sustainable and vibrant human settlements. This approach is reflected in the new title of the book - *Guidelines for Human Settlement Planning and Design* (Austin and Biermann 1998). In this context, a "human settlement" is regarded as any built environment where people live, work and play, with the provision that only residential areas, and other developments associated therewith, are considered in this book.

A "living document": the Red Book workshops

In terms of its mandate, the Division of Building and Construction Technology has undertaken to maintain the *Red Book* as a continually updated "living document" (Schlotfeldt 1995a). Standards should be seen as a reflection of society's values at any given time; moreover, values and priorities are not inflexible but rather in a constant state of change. Technology also develops and changes and the *Red Book* should reflect this evolution. A series of five workshops were held in February and March 1995 in Bloemfontein, Cape Town, Pretoria, Durban and Port Elizabeth, where users and other interested parties were afforded the opportunity to discuss the applicability of the guidelines and provide constructive criticism with a view to the document's improvement and further development. Other forums, such as conferences and meetings of a number of professional societies, were also used as platforms for discussion and information concerning the book.

The workshops were attended by nearly 700 delegates representing a wide range of interests (e.g. consulting engineers, urban planners, local and regional authorities, provincial and central government departments, universities, technikons, developers, manufacturers, financiers and NGOs). The result of the deliberations was a great number of valuable recommendations and suggestions for improving the guidelines, as well as many requests for additional guidelines on various subjects. All the recommendations received serious consideration and the vast majority have been taken up in this revised document. There was consensus amongst all parties present at the workshops that, in any development, a holistic, integrated planning process is an essential requirement and that planners, engineers and other professionals need to work together right from the conceptual stage of a project to achieve this. It is largely as a result of the input from the planning profession during these and later deliberations that not only was a framework for the redevelopment of the urban planning guidelines produced, but also the guiding philosophy for the entire document.

Investment in infrastructure is crucial to the efficiency and habitability of our urban areas. World Bank research (South Africa 1995) indicates that investment in infrastructure stock has a significant impact on GDP growth, as infrastructure raises general levels of welfare and health. It is also realised, however, that eliminating - or even just reducing - the housing backlog will simply be beyond reach if the highest level of infrastructure (i.e. fully reticulated water and electricity supply, full waterborne sanitation, etc) is regarded as the norm. There needs to be space for incremental approaches to provide sustainable and affordable levels of service while ensuring acceptable and adequate functionality. Creative and varied solutions are thus required, and it is not necessary to confine housing strategies to conventional methods and technologies. A balance between established practices and new ideas and developments is thus required.

PURPOSE AND LEGAL STATUS OF THIS DOCUMENT

Urban planners and engineers are continually confronted with the dichotomy of the needs or aspirations of communities versus their ability to pay for housing and services (Austin 1996). The central government has set limits on its ability to provide grants and subsidies for services. Local governments will therefore be largely responsible for making provision for access to most of the engineering services and amenities by persons residing within their area of jurisdiction. Furthermore, these services and amenities must be rendered in an environmentally sustainable manner and must also be financially and physically practicable. Information is thus required on all available service technologies and complementary spatial settlement planning, so that informed decisions may be made on what is most suited to a particular community and what is sustainable.

The need for this information is not confined to technical professionals only. All those who are required to take decisions on policy at the various levels of government or within non-governmental organisations can benefit substantially by having greater insight into the possibilities and limitations of various available options. Such insights will enable them to interact more effectively with consultants and community structures, and the *Red Book* is also aimed at providing these insights in a manner that is both understandable and useful to non-technical persons.

For sustainable progress, as well as for the general health and well-being of the population, settlements should be coherently planned; there should furthermore be a choice between a range of affordable technologies, particularly in the water-supply and sanitation fields. Service levels should be appropriate, as a high level of service which fails (for whatever reason) may well pose a greater threat to public health and the environment than an inadequate lower level of service. Various factors, for example high population densities or adverse geotechnical conditions, may also dictate that consideration be given to alternative types of service technology. However, only proven designs should be used and, ideally, communities should be able to exercise choice within a range of approved designs. In this context, appropriate technology may be defined as "meeting the needs of a particular community at a particular time".

In order to achieve the above objectives, engineers and urban planners need to be provided with *guidelines*, as opposed to standards. Guidelines are intended to assist decision-making, whereas standards are enforceable absolute limits (Schlotfeldt 1995a). It is recognised that both the rigid application of guidelines as well as the setting of inappropriate standards can have the opposite effect to that intended. The inter-departmental coordinating committee tasked with overall direction of the revision of the *Red Book*, as well as the steering committees involved, were of the opinion that the concept of "guidelines" should continue to prevail, and that the provisions of this document could thus not be legally enforceable. The use of these guidelines by the various disciplines involved in the design, supply and management of serviced land for residential development would be strongly encouraged, however.

It should be noted that only "local" services and planning issues are considered. Bulk services and amenities - for example main water supply pipelines, outfall sewers, treatment works, landfills, freeways and so forth - are considered beyond the scope of this document.

The intention of the new *Red Book* is to provide performance-based guidelines for informed decision-making. The purpose is essentially to indicate the qualities that should be sought in South African settlements, and to provide practical guidance on how these qualities can be achieved. The document is therefore intended to be educative, providing ideas and useful information, and not as a substitute for innovative planning and engineering practice (Behrens 1997).

ROLES AND INTERACTION OF PROFESSIONALS INVOLVED IN THE BUILT ENVIRONMENT

The primary readers of this book will be the range of professional and other persons that contribute to the planning and design of human settlements (i.e. architects, urban designers, town and regional planners, civil, transportation and electrical engineers, energy practitioners, etc) from both the private and public sectors. The document attempts to integrate information that is relevant across different disciplines and, unlike its predecessor, moves away from having separate and exclusive sections on "engineering" and "planning".

The fullest cooperation between the various professionals engaged in human-settlement planning is crucial to achieving sustainability, and thus also replicability (Austin and Biermann 1998). A common strategy is required in order for the development process to be geared towards meeting the particular needs of communities in a manner which is acceptable to them, and not merely acceptable to the planner, designer, financier or local authority. The guidelines represent a balanced and integrated approach to settlement planning and, although unlikely to satisfy everybody, represent the culmination of four years of intensive planning, research, writing, debate, questioning, criticism and rewriting. Engineers, architects, urban planners and academics have worked together and achieved basic agreement on the requirements for housing the nation in a sustainable manner.

This document is the result of input from a wide range of participants. Relevant national and provincial government departments were involved through representation on the coordinating committee. Local government, the private sector, academics and organised professional bodies participated through the various steering committees. Academic and practising experts contributed by authoring sections of the book. Specialist workshops, involving a broader spectrum of expertise, were held at key stages during the process to debate concepts and drafts. Universities, professional engineering and planning bodies, relevant national, provincial and local government departments and bodies, as well as selected practising consultants, all formed part of a beta-testing programme, where the final draft was distributed to a sample of potential users of the book for comment.

HOW TO USE THE DOCUMENT

This document is explicitly not intended to be an administrative "check list" for local authority officials (Behrens 1997). It will instead provide guidance on appropriate practices and technologies. Emphasis is placed on assessing "performance" (in relation to issues like health, safety, recreation, education and trade) as opposed to simply assessing the quantitative dimensions of the plan to ensure some form of compliance with stated norms. Once again it is emphasised that these are *guidelines*, not specifications. The document therefore does not remove professional responsibility from practitioners, and certainly does not replace the need for professional experience and judgement. The contents should therefore not be rigidly applied, but rather perceived as an aid to preparing one's own project plans and specifications.

Various national and provincial government departments, statutory bodies and local authorities may also have their own sets of guidelines for use by planners and engineers. It is not the intention of this document to take the place of these other guidelines. Rather, the *Red Book* should be considered as being supplementary to them, because local conditions and experiences can often dictate what procedure should be followed in specific cases.

STRUCTURE OF THE DOCUMENT

Although significant effort was made to approach the revision process in an integrated manner, the presentation of the material in document form required it to be divided into manageable and readable sections.

Chapter 2 provides a guiding philosophical framework for the entire document and discusses an appropriate context for settlement-making relating to the two central concerns of human- and nature-centred development. Performance qualities are identified, clarifying desirable achievements in settlement formation. The nature and planning of human settlements is described and the importance of structure is emphasised.

Chapter 3 focuses on settlements as systems made up of functionally interrelated elements. The chapter sets out the starting points for achieving positively-performing settlements, the principles that are important in achieving highly functional settlements and provides a synthesis of the principles as well as an application of the principles and the planning guidelines. Chapter 3 can therefore be seen as providing the link between the framework presented in Chapter 2 and the practical guidelines provided from, and including, Chapter 5.

Guidance on the planning method and the participation required is given in Chapter 4, where human-scale development and partnership-based participation are advocated.

Chapter 5 provides qualitative and quantitative guidelines relating to the planned elements of a settlement system. Its sections relate to the following interrelated - and somewhat artificially separated - planned elements of settlement systems: (5.1) movement networks; (5.2) public transport systems; (5.3) hard open spaces; (5.4) soft open spaces; (5.5) public facilities; (5.6) land subdivision; (5.7) public utilities and (5.8) cross-cutting issues. The purpose of presenting the various planned elements of settlement systems separately, is to present useful information relating to settlement systems in an accessible and distinguishable way, rather than to suggest that these elements of the settlement system should be planned in isolation.

Section 5.8 focuses on cross-cutting issues that have relevance across both the planning and engineering spectrums. These include environmental design for safer communities (5.8.1), ecologically sound urban development (5.8.2), and fire safety (5.8.3).

Chapter 6 sets out stormwater management principles in a manner which complements and reinforces the foregoing urban design principles and the following chapters on road design, sanitation and solid waste management. Road layout issues were prepared largely in conjunction with the movement networks guidelines (5.1) with the result that Chapter 7 has been confined largely to detailed engineering issues while the geometric planning component has been incorporated into section 5.1. Chapter 8 provides a comprehensive and modern approach to road pavement design, construction and maintenance, with special emphasis on lower-order roads.

The water supply and sanitation chapters (Chapters 9 and 10) have been thoroughly revised in order to make them more useful and relevant. The previously incorporated section on water treatment has been removed as it is considered to be a bulk service and thus beyond the scope of this book; it is furthermore regarded as a specialised subject, which cannot be given justice in a broad guideline document of this nature. The details on waterborne sewerage design have also been removed, with other design manuals being referred to instead. The guidelines have concentrated, rather, on providing designers with broad background information on the multiplicity of sanitation systems available, to enable them to apply the most appropriate technologies under the specific circumstances, while providing sufficient reference material for their needs.

The solid waste management section (Chapter 11) sketches the legislative background pertaining to waste handling and also sets out the different levels of service in a way which maximises employment and opportunities for entrepreneurship. On-site storage, transfer stations and recycling operations are also described. Landfills are not dealt with as they are regarded as a bulk service. However, broad guidelines pertaining to landfills, in so far as they are required for settlement planning purposes, have been included.

Guidelines on energy (Chapter 12) have been presented in two parts, the first part dealing with conventional grid electricity and the second with alternative and renewable energy sources. The latter section includes details on “clean” technologies such as solar power and other appropriate energy opportunities for poor or small rural communities. Urban planning principles which facilitate the application of alternative energy technologies are also encouraged.

CONCLUSION

The concept of *sustainability* is a philosophy common to all sections of this guideline document. Sustainability should always be the main concern in any type of development. This has the following implications (Miles 1995):

- development projects should contribute to technology transfer and skills development;

- beneficiaries must have effective control of their environment;
- an operational and sustainable product or system must be delivered; and
- systems should be capable of being operated and maintained using local resources.

The emphasis has shifted from merely providing serviced erven in the most cost-effective manner to the creation of sustainable living environments and thriving communities. New demands are being placed on professionals involved with the development of human settlements, from the application of unfamiliar technologies to social science and community organising skills, as well as technology transfer and skills development. It is expected that such professionals will increasingly turn to guideline-type documents in order to obtain the required information. It is thus imperative that the revised *Red Book* remains a living document; constant input by practitioners and researchers will ensure that this goal is achieved. Constructive criticism and comment from users of the document will therefore be welcomed.

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